

CLAIMS

We claim:

1. A method for testing wire bonds in an integrated circuit package, comprising:

bonding an integrated circuit silicon die to a package substrate;

forming a wire connection between a circuit contact pad in said integrated circuit silicon die and a lead contact pad in said package substrate; and

testing said wire connection for detection of non-stick failure with a testing device, wherein the silicon substrate of said integrated circuit provides electrical continuity for said non-stick detection between said circuit contact pad and a dedicated contact pad in said package substrate which is electrically coupled to said testing device.

2. A method as described in Claim 1, wherein said bonding said integrated circuit die to a package substrate is performed using conductive epoxy.

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3. A method as described in Claim 1, wherein said bonding said integrated circuit die to said package substrate is performed using non-conductive epoxy.
4. A method as described in Claim 1, wherein each of said lead contact pads in said package substrate are electrically isolated from other lead contact pads in said package substrate.
5. A method as described in Claim 1, wherein said bonding said integrated circuit silicon die provides electrical continuity between said integrated circuit silicon die and said dedicated pads in said package substrate.
6. A method as described in Claim 1, wherein said testing said wire connections for non stick failure comprises testing said wire connection for continuity through a circuit contact pad on said integrated circuit die and a dedicated contact pad in said packaging substrate.
7. A method as described in Claim 1, wherein said testing of said wire connections for non stick failure comprises testing said wire connection for a short through said lead contact pad on said packaging substrate.

8. A method as described in Claim 1, wherein said method is performed recursively for a plurality of said wire connections.
9. An integrated circuit packaging device comprising:
- a laminate substrate comprising a first surface and a second surface, said first surface being disposed to mount an integrated circuit chip and said second surface being disposed to mount on a surface of a printed circuit board;
  - an array of lead contact pads on said first surface, said lead contact pads being disposed to provide wire bond connections to circuit contact pads in said integrated circuit;
  - an array of solder ball contact pads on said second surface;
  - routing layers disposed to provide electrical coupling between said lead contact pads on said first surface and said solder ball contact pads on said second surface; and,
  - dedicated contact pads on said first surface disposed to electrically couple to a substrate of said integrated circuit die.
10. An integrated circuit packaging device as described in Claim 9, wherein each of said contact lead pads is electrically coupled by a

trace in a routing layer with one or more of said solder ball contact pads.

11. An integrated circuit packaging device as described in Claim 9, wherein said contact lead pads are electrically isolated from other contact lead pads in said laminate substrate.

12. An integrated circuit packaging device as described in Claim 9, wherein said array of solder ball contact pads are electrically isolated from other solder ball contact pads in said laminate substrate.

13. An integrated circuit packaging device as described in Claim 9, wherein said routing layers comprise a printed circuit.

14. An array molded laminate substrate for integrated circuit packaging, comprising:

a mold gate ground;

a plurality of integrated circuit packaging substrates, each comprising lead contact pads and routing layers, wherein said plurality of packaging substrates is formed in a unit molded laminate sheet; and

a grounding line electrically connecting a dedicated contact pad on said integrated circuit packaging substrates with said mold gate ground.

15. An array molded laminate substrate as described in Claim 14, wherein said plurality of integrated circuit packaging substrates are enabled as ball grid array substrates.

16. An array molded laminate substrate as described in Claim 14, wherein said lead contact pads in said integrated circuit packaging substrate are electrically isolated from other lead contacts in said packaging substrate.

17. An array molded laminate substrate as described in Claim 14, wherein said grounding line connects said dedicated contact pads in each of said integrated circuit packaging substrates with said dedicated contact pads on other integrated circuit packaging substrates in said array molded laminate substrate.

18. An array molded laminate substrate as described in Claim 14, wherein said lead contacts in said packaging substrates are connected to an electrical ground for electroplating.

19. An array molded laminate substrate as described in Claim 14, wherein said packaging substrates enable functional testing of said

integrated circuits before separation from said array-molded laminate array.

20. An array substrate comprising:

a common bus;

a plurality of electrically isolated contact leads disposed on a first surface;

a plurality of solder balls disposed on a second surface, wherein each solder ball is electrically coupled to a respective contact lead; and

an area of said first surface for receiving an integrated circuit die, said area comprising a dedicated contact pad for electrically coupling with said integrated circuit die, wherein said dedicated contact pad is coupled to said common bus ground.

21. An array substrate as described in Claim 20 wherein said integrated circuit die comprises circuit contact pads to be connected to respective lead contact pads.

22. An array substrate as described in Claim 20 wherein said dedicated contact pad is for providing electrical connection through

said integrated circuit die to a contact pad and a respective lead contact pad for performing non-stick detection of a bonding wire.

23. An array substrate as described in Claim 20 wherein said non-stick detection is non-stick on lead detection.

24. An array substrate as described in Claim 20 wherein said non-stick detection is non-stick on pad detection.

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